Math 254 ASSIGNMENT 8 **Due on 4/30**

1. The position function for a projectile is $\vec{\mathbf{r}}\,(t) = \langle 417t, -16t^2 + 351t + 250\rangle$.

   For the following, round distances to the nearest foot, times and angles to the nearest tenth. **Show clearly how each answer is obtained.**

   (a) What height is the projectile launched from?

   (b) When does the projectile hit the ground?

   (c) What is the maximum height of the projectile (above the ground)?

   (d) How far does the projectile travel through the air?

   (e) How far does the projectile travel horizontally before hitting the ground? (Assume level ground.)

   (f) At what angle above horizontal is the projectile launched?

   (g) How fast is the projectile going when it is launched?

   (h) How fast is the projectile going when it is at maximum height?

There is more on the back!

Math 254 ASSIGNMENT 8 **Due on 4/30**

1. The position function for a projectile is $\vec{\mathbf{r}}\,(t) = \langle 417t, -16t^2 + 351t + 250\rangle$.

   For the following, round distances to the nearest foot, times and angles to the nearest tenth. **Show clearly how each answer is obtained.**

   (a) What height is the projectile launched from?

   (b) When does the projectile hit the ground?

   (c) What is the maximum height of the projectile (above the ground)?

   (d) How far does the projectile travel through the air?

   (e) How far does the projectile travel horizontally before hitting the ground? (Assume level ground.)

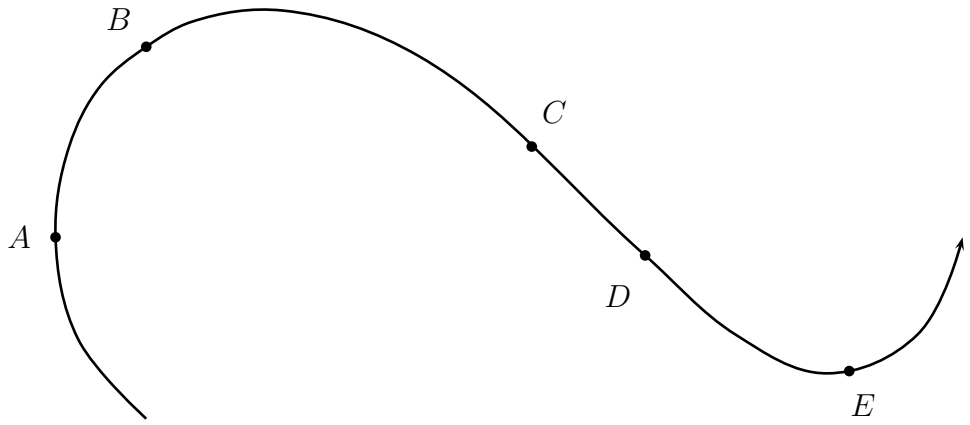
   (f) At what angle above horizontal is the projectile launched?

   (g) How fast is the projectile going when it is launched?

   (h) How fast is the projectile going when it is at maximum height?

There is more on the back!

2. A particle is traveling on the curve below, going from left to right overall, as indicated by the arrowhead at the end of the curve. At point A the particle is slowing down, at points B and C it is going at a constant speed, and at points D and E it is speeding up. **Assume that the curve is straight at points C and D.** Draw in the tangential and normal components of the acceleration at each of those points. Label each tangential component $\vec{\mathbf{a}}_T$ and label each normal component $\vec{\mathbf{a}}_N$. In cases where either is $\vec{\mathbf{0}}$, write that near the point.



2. A particle is traveling on the curve below, going from left to right overall, as indicated by the arrowhead at the end of the curve. At point A the particle is slowing down, at points B and C it is going at a constant speed, and at points D and E it is speeding up. **Assume that the curve is straight at points C and D.** Draw in the tangential and normal components of the acceleration at each of those points. Label each tangential component $\vec{\mathbf{a}}_T$ and label each normal component $\vec{\mathbf{a}}_N$. In cases where either is $\vec{\mathbf{0}}$, write that near the point.